MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2016/17

TOS2581 – OPERATING SYSTEMS & INTERNETWORKING

(All sections / Groups)

10 OCT 2016
9:00am-11:00am
(2 Hours)

INSTRUCTION TO STUDENT

1. This Question paper consists of 5 pages including cover page with 6 questions only.
2. Attempt **FIVE** out of six questions. All questions carry equal marks (12 marks) and the distribution of the marks for each question is given.
3. Please print all your answers in the Answer Booklet provided.

Question 1

a) Exchanging data between hosts is all about performing IO operation via a network adapter. What are the functions of a network adapter? **(3 marks)**

b) In early days a user who subscribe to an ISP will dial-up to the ISP to retrieve their personal email from their ISP account. There was no Hotmail, Gmail or any other web-based email. Explain how the email systems work during that time. **(3 marks)**

c) What are the advantages and disadvantages of a distributed system over a centralized system? **(2 marks)**

d) Contrast and compare Network Operating Systems (NOS) with Distributed Operating Systems (DO/S). **(4 marks)**

Question 2

a) Network Manager in DO/S provides intrasite and intersite communication. Distinguish between Process-Based DO/S and Object-Based DO/S network management. **(3 marks)**

b) Memory Manager in DO/S uses a kernel with paging algorithm to track the amount of available memory. List six functions of the memory manager in DO/S. **(3 marks)**

c) Describe how DO/S protects a file from access or modification by an unauthorized user and compare it to NOS file protection. **(3 marks)**

d) In distributed systems each site only knows about its own resources. However, deadlock may involve distributed resources. What are the three distributed deadlock detection schemes? **(3 marks)**

Question 3

a) Depict a diagram to describe Virtual Local Area Network (*VLAN*)? What is it used for? **(4 marks)**

b) What is Secure Shell (SSH)? What are the three SSH distinction layers? **(4 marks)**

c) What is the communication daemon? Why is internet service daemon (inetd) needed? **(2 marks)**

d) What does Authentication Header (AH) protocol add to the IP packet? **(2 marks)**

Continued .....

Question 4

a) What is the role of DNS when you send an email? **(2 marks)**

b) Explain what is the function of DHCP in a wireless router such as one from Linksys? **(2 marks)**

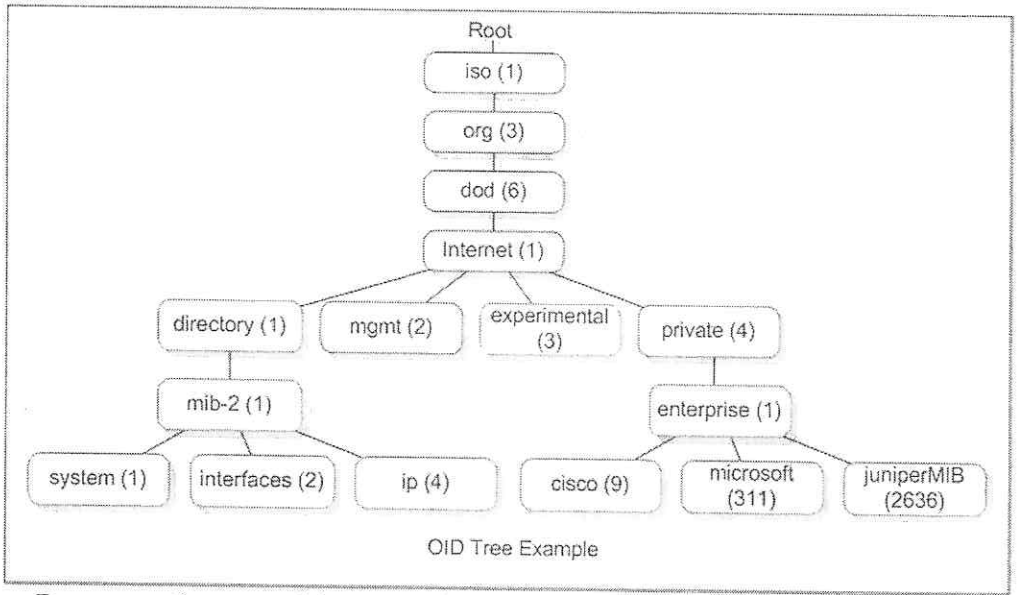
c) In a Linksys router, there is an option for NAT. What is the function of NAT? **(2 marks)**

d) Using a diagram explain what ICMP redirection is? **(3 marks)**

e) What is the function of IGMP packet? **(3 marks)**

Question 5

a) Considering the following OID tree example. A SNMP manager decides to retrieve the system UpTime for a device 10.100.100.254. What is the OID required in snmpget command? **(3 marks)**



OID Tree Example

sysDescr :: = { system 1 } , sysObjectID :: = { system 2 }, sysUpTime :: = { system 3 }
sysContact :: = { system 4 }, sysName :: = { system 5 }, sysLocation :: = { system 6 }
sysServices:: = { system 7 }

b) There are six parties involved in this security protocol over a shared LAN connection where all parties can listen to the channel. The details are shown in the table below

Parties	Public Key	Private Key	Sender Msg (text)	Share Key
Ali	PubKeyAli	PrivKeyAli	MsgAli	See definition below

Continued .....

Balan	PubKeyBalan	PrivKeyBalan	MsgBalan	
Chong	PubKeyChong	PrivKeyChong	MsgChong	
Doris	PubKeyDoris	PrivKeyDoris	MsgDoris	
Elanie	PubKeyElanie	PrivKeyElanie	MsgElanie	
FAMA	PubKeyFAMA	PrivKeyFAMA	MsgFAMA	

The definition of MsgXXX, MsgAli meant Ali send out a plain text message.

The definition of ShareKey is like this:

- ShaKeyAli_Balan means that this key is shared by Ali and Balan. Only Ali and Balan know the key.
- ShaKeyAli_Balan_Doris means that this key is shared by Ali, Balan and Doris.
- Some of the algorithms used are SHA-256, AES, DES, MD5 and Diffe-Hellman.
- The word "process" can mean encryption, hashing, signing, verify or key-exchanging.

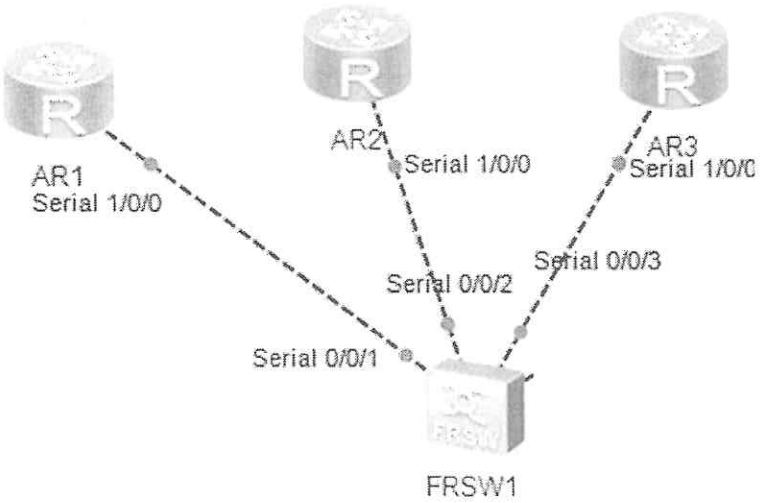
With these definitions, answer the following questions.

i. Doris does not want anyone else other than Elaine to view the message content. Explain how Doris and Elaine should process their message. **(3 marks)**

ii. Elaine can be sure that Doris cannot deny that the message does not originate from her. Explain how Doris and Elaine should process their message. **(3 marks)**

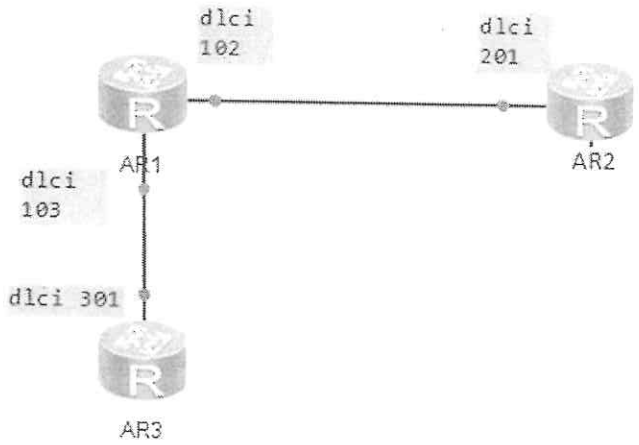
c) Below is a physical and logical topology of a network. Configure the frame relay connection table so that the logical topology can be implemented via existing physical topology.

Physical Topology. Sub interfaces are used in each router.



Continued .....

Logical Topology.



Fill in the blank in the following frame relay connection table. **(3 marks)**

InDLCI	InPort	OutDLCI	OutPort

Question 6

a) Mr PutarBelit and Mr TipuOrang are sharing the same secret key "SusahTipu" to secure (it can be encrypt, decrypt, hash and other security measure) their communication channel. One day, Mr PutarBelit claimed that Mr TipuOrang promised to sell one IPhone at the same price as a MI Phone. Mr PutarBelit also showed the decrypted message sent by Mr TipuOrang. Mr TipuOrang stated that he did not make such statement/claim. Will Mr PutarBelit be successful in making his claim? Explain why. **(3 marks)**

b) Integrated Services (IntServ) is a flow-based QoS model. Discuss how IntServ would provide individualized QoS guarantees to individual application. **(3 marks)**

c) RVSP makes uses of PathMessage and ResvMessage. Explain what PathMesage and ResvMessage are. **(3 marks)**

d) Give one difference between reactive fault management and proactive fault management in network management. **(3 marks)**

End of Paper